

Declaration of the Federal Republic of Germany

National Research Programmes and Policy on Acidification  
by Dr. Gerhard Feldhaus  
Federal Ministry of the Interior

ABSTRACT

Research into acidification focusses on cause/effects of forest damages. Further subjects are damages to waters, materials, historic monuments. Long-range dispersion and chemical transformation of air pollutants will be studied by the EUROTRAC programme within the EUREKA research activities. Studies of transboundary fluxes are being commissioned as well.

Measures aiming at a reduction of SO<sub>2</sub>, NO<sub>x</sub> and hydrocarbon emissions are put into effect. Due to these measures a decrease of national SO<sub>2</sub> emissions from the present approximately 3 million t/a to 1.6 million t/a in 1988, and finally to less than 1.2 million t/a in 1993 is expected. In the case of NO<sub>x</sub> emissions a decrease from approximately 3.1 million t/a in 1982 to less than 2.5 million t/a by 1988, and eventually to less than 1.6 million t/a by 1993 is estimated. Organic compounds emissions are being estimated to decrease from approximately 1.8 million t/a in 1978 to approximately 0.9 million t/a by the middle of the 1990ies. The government of the Federal Republic of Germany, together with ten more countries, suggests that negotiations start within the UN ECE as early as this year on a Protocol concerning the reduction of NO<sub>x</sub> and hydrocarbon emissions. It is furthermore requested to make binding provisions under international law at an early date for the drastic reduction of these emissions within a certain period of time, whereby best available reduction technologies should serve as a guiding principle.

This conference is a follow-up to a decision of the Multilateral Conference on the Environment held in Munich in 1984. Participating countries committed themselves to regularly convening international symposia for the exchange of the latest scientific findings on acidification and long-range transboundary air pollution as well as to discuss their implications for political measures.

The government of the Netherlands in cooperation with the UN ECE has now put this decision into effect. On behalf of my government I should like to express my warmest thanks to Minister Winsemius for having taken this initiative, to convene this very important conference in cooperation with the ECE. I should like to congratulate the organizers of the conference for their excellent preparatory work as well as for ensuring the very smooth progress of the meetings. Furthermore I should like to mention our appreciation for the outstanding hospitality extended to us.

In the course of this week we have acquired further detailed knowledge of recent results of effects research. Uncertainties concerning the effects and the extent of damages by acid deposition and photo-oxidants have subsequently been further minimized.

Likewise, uncertainty about the urgency of taking measures to considerably reduce acid-forming sulphurdioxide and nitrogenoxides emissions as well as photo-oxidants-forming nitrogenoxides and hydrocarbons, has also been removed. This is being confirmed by findings of our extensive national research programme, in particular for the forest damages.

Since the most severe damages are to be observed in our forests, research into the causes of these types of damages was intensified since the beginning of 1983.

October 1983 saw the launching of the action programme "Save our Forests", which combines research and practical measures for emission reductions.

The main fields of research are:

- o assessment of forest damages
- o mechanisms of damages

- o air quality and deposition in forest areas
- o dispersion, transformation and deposition of air pollutants
- o development and improvement of emission control techniques.

Since then research projects are being financed by funds amounting to Deutschmark 90 million. These projects investigate mainly the area of cause/effect by air pollutants. Furthermore, forestry measures which could contribute to a stabilization of endangered forests, are being considered.

Research into effects of air pollutants on materials and historic monuments is focussed upon the assessment and evaluation of damages to particularly sensitive materials. In the case of special materials, such as polymeres, and objects, such as medieval stained glas windows and museum exhibits passive protective measures have been investigated. The latter are already effective in the preservation of monuments.

Emphasis is laid on the investigation of acidification of surface waters and on the ascertainment of related damages. For this reason, the Federal Minister of the Interior has made funds available amounting to a total of Deutschmark 5.1 million for the funding of research projects since 1983.

Here, the investigation of impacts of acidifying substances on the quality of ground and surface waters is of major importance. The evaluation of the results by using uniform methods as well as monitoring in special areas are of primary importance. Starting in 1986 the Federal Republic of Germany will take part in the ECE monitoring programme of acidified waters due to air pollutants.

In the Federal Republic of Germany forest damages are estimated to at least 1 Billion Deutsch-Mark per year; damages to buildings and other materials, historical monuments as well as on stained - glass windows may come up to nearly 3 Billion Deutsch-Mark per year.

In a recent study a prediction was made to calculate future costs. The forecast assumes in Europe a reduction of sulphur dioxide deposition by 40 % and a nitrogen dioxide deposition by 30 % before 1996. Even under this

improved conditions the forecast estimates yearly costs by damages to forests to around 2 Billion Deutsch-Mark per year, caused by still increasing forest damages.

Forest damages are an indicator in our time for the neglect in the past. All industrialized nations have experienced a comparable development throughout the century in terms of an almost steady growth in air pollution. It is only now, that this development is indicating a reverse trend. And we call on all countries, in their common interest, to take further cooperative and effective measures to reduce emissions and considerably lower the export and import of air pollutants.

Alongside the air quality protection policy within the European Communities, therefore, the government of the Federal Republic of Germany considers the implementation of the Convention of 1979 on the Long-Range Transboundary air pollution to be of utmost importance.

In recent years, my government has introduced a number of practical measures on a national level aimed at the improvement of our own environment and displaying a concern for the environment of our European neighbours.

The key element of our measures is the mandatory retrofitting of existing large-scale furnaces with flue gas treatment equipment within stipulated short periods of time.

Industry has already started retrofitting and modernization; in particular the electricity generating industry has already started to equip existing power plants with new flue gas cleaning facilities. The Association of German Electricity Suppliers informed us that already at the end of 1985 one third of those power plants that are subject to retrofitting was equipped with flue gas desulphurization.

According to latest plans, 80 % of existing coal and oil fired power plants of the public electricity supply will be fitted with flue gas desulphurization plants over the next years. The remaining 20 % will be closed down by 1993 at the latest. Extensive retrofitting of all old industrial plants is also being carried out.

At the same time for all industrial plants emission standards - also those for sulphurdioxide and nitrogenoxides - have been tightened up in accordance with the latest state of technology. These emission reduction measures are supplemented by the intended reduction of sulphur in light fuel oil as well as by the successful introduction of the low-pollution cars, esp. by tax reduction measures.

In consequence to these and other regulatory measures a decrease of national sulphurdioxide-emissions from the present approximately 3 million tons per year to 1.6 million tons in 1988 and finally to less than 1.2 million tons per year in 1993 is expected. We thus will be more than fulfilling our commitment to the Helsinki Protocol on the reduction of sulphur emission in terms of both time and reduction rate.

National nitrogenoxides-emissions are expected to have decreased by 1993 as follows: from approximately 3.1 million tons in 1982 to less than 2.5 million tons by 1988, and eventually to less than 1.6 million tons by 1993. The first large-scale facility for a catalytic NO<sub>x</sub> reduction started operation at a power plant at the end of 1985.

National organic-compounds emissions are estimated to have decreased by the middle of the nineties as follows: from a maximum of 1.8 million tons per year in 1978 to 1.6 million tons at the present time, to approximately 0.9 million tons per year in the nineties.

A calculation of the decrease of acid deposition as a result of emission reduction measures is possible, if transportation and transformation processes are modelled. It is estimated that a 50 percent reduction of sulphurdioxide emission in the Federal Republic of Germany will lead to the following decrease of sulphur deposition: a reduction from the present 35 mg per square meter per day to 25 mg in heavily polluted areas, and from present 12 mg to 9.5 mg of sulphur per square meter per day in less polluted rural areas.

In large areas of Central Europe sulphur deposition still amounts to 12 mg per square meter per day or even more. This is definitively too high. At a rate of less than 4 mg per square meter per day only, one can assume that no long-term effects on, for example, lakes will occur. This deposition rate can only be achieved by international measures.

It is therefore important that

- o the sulphur protocol rapidly becomes effective and is implemented accordingly
- o more states sign the protocol and
- o that, as a further development of the protocol, further reductions of sulphur emissions are made within a short time.

At this stage of my remarks I should like to reiterate the appeal which we made at Helsinki last July. We requested that reduction measures on the second priority pollutant, the nitrogenoxides, be treated with the same resolution as in the case of sulphur.

I am convinced that we cannot afford to postpone this urgent problem much longer without running the risk of having to come to terms with irremedial longer-term damages through acidification and photo-oxidants.

As a first step, a Working Group on NO<sub>x</sub> was established in July 1985 in Helsinki. This panel has the mandate to work out a basis for appropriate measures and make proposals for the reduction of nitrogenoxides-emissions. This reporting period is to be contained within as short a period as possible to facilitate a rapid agreement on a NO<sub>x</sub> Protocol.

The government of the Federal Republic of Germany lends its full support to any activity designed to speed up this process. At the first meeting of the NO<sub>x</sub> Working Group last year the delegation from my country already proposed possible constituent elements for such a Protocol.

We are furthermore of the opinion that in view of dangers and damages caused by photo-oxidants a reduction of hydrocarbon emissions should be agreed upon as soon as possible.

In this connection let me refer to the declaration pronounced last February at Saas Fee. The environment ministers of eleven states made the particular, urgent request that the contracting parties start negotiations as early as this year on a Protocol concerning the reduction of nitrogenoxides and hydrocarbons-emissions. It is furthermore requested to make binding pro-

visions under international law at an early date for the drastic reduction of these emissions within a certain period of time; best available reduction technologies should serve as a guiding principle.

I trust that on the basis of both the outcome of this conference here in Amsterdam and the work of the NO<sub>x</sub> Working Group the Executive Body of the ECE-Convention will take the necessary steps.